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Computational and Mathematical Methods in Medicine

Special Issue on
Advances in Cardiovascular Signal Processing

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Advanced cardiovascular signal analysis and computing methods have been gaining a significant role in the field of cardiovascular research. They are scientifically and clinically useful to better understand the underlying mechanisms of the physiological and pathological processes, hence providing opportunities to develop new diagnostic and therapeutic techniques for cardiovascular diseases. The mainstream in cardiovascular signal processing is moving towards more profound methods based on advanced signal analysis techniques as well as more effective mathematical modeling approaches.

The main focus of this special issue is on advanced signal processing methods for cardiovascular signals (including ECG, arterial pulse, heart sound, Doppler echocardiography, and respiratory signals). The special issue will be an international forum for researchers to report the most recent developments and ideas in the field.

Potential topics include, but are not limited to:

- Time series analysis, including linear and nonlinear analysis of cardiovascular variability
- Quality assessment of cardiovascular signals
- Application of data mining algorithms such as decision trees, neural networks, and deep machine learning, for the available public data sources, such as MIT-BIH database
- Arterial pulse waveform analysis and modeling
- Heart sound and respiratory signal processing
- Doppler echocardiography techniques and their clinical application
- Comparison analysis for cardiovascular signals under different physiological or pathological backgrounds
- High-performance computing and big data processing
- Cardiovascular mobile health and wearable and body area network techniques
- Application of signal analysis and computing methods in cardiovascular disease detection, including cardiac arrhythmia, atrial/ventricular fibrillation detection, and heart failure

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dingchang.zheng@ncl.ac.uk

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feng@itee.uq.edu.au

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matti.huotari@ee.oulu.fi

Yi Su, Institute of High Performance Computing (A*STAR), Singapore
suyi@ihpc.a-star.edu.sg

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